UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,714	07/20/2006	Yair Ein-Eli	30579	6188

67801 7590 03/23/2009

MARTIN D. MOYNIHAN d/b/a PRTSI, INC.
P.O. BOX 16446
ARLINGTON, VA 22215

EXAMINER	
PARVINI, PEGAH	
ART UNIT	PAPER NUMBER
1793	
MAIL DATE	DELIVERY MODE
03/23/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/551,714	EIN-ELI ET AL.	
	Examiner	Art Unit	
	PEGAH PARVINI	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54* is/are pending in the application.

4a) Of the above claim(s) *37-52 and 54* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36 and 53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/27/2008, 10/3/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicant's election of Group I, claims 1-36 and 53 in the reply filed on 1/5/09 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 31-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 31 provides for the use of a composition of claim 1 for forming a passivating layer on a substrate, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 31-36 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper

definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claims 32-36 are rejected as being dependent upon claim 31.

Claims 7 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "more positive" in claim 7 is a relative term which renders the claim indefinite. The term "more positive" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. .....

The term "substantially" in claim 23 is a relative term which renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. By the term “substantially”, it is not clear whether minor amounts of film-forming agent is permitted or no amount of a film-forming agent should be present.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-12, 23-36, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,447,371 to Brusic Kaufman et al. alone or in view of U.S. Patent No. 6,589,099 to Haggart, Jr. et al.

Although claims 31-36 are use claims, they are still being incorporated into this rejection.

Brusic Kaufman et al. teach a first and a second CMP slurries, wherein the first CMP slurry, having a pH of from about 2.0 to about 12.0, comprises an oxidizing agent such as hydrogen peroxide, or a permanganate, etc., an abrasive such as silica, alumina, or others in an amount of 0.5 to 15.0 wt% (column 3, lines 44-51; column 5, lines 17-33; column 7, lines 15-21; column 9, lines 29-38) wherein said slurry forms a passivation layer on the substrate (column 5, lines 55-56). It is to be noted that the reference, also, discloses applying said slurry onto substrates such as copper substrates to oxidize the copper to copper oxide (column 4, lines 24-27, 50-53, and 60-67). The reference discloses overlapping ranges of amount of abrasive and pH of the slurry with the ones instantly claimed, and overlapping ranges have been held to establish *prima facie* obviousness. See MPEP § 2144.05.

Although the reference discloses the use of complexing agents in the slurry, it does not disclose the use of copper complexing agents; thus, said reference is seen to read on the limitation of claim 24.

Also, the reference is seen to read on the limitation of instant claim 23 motivated by the fact that the reference makes it clear that the use of a number of additives such as film-forming agents is optional (column 4, lines 30-35; column 6, lines 25-30).

With reference to the limitations drawn to oxidation potential of the slurry, it should be noted that the reference discloses a CMP slurry having an overlapping range of pH containing similar abrasives and oxidizers used for polishing copper substrate by forming a passivation layer onto said substrate; therefore, the oxidation potentials as recited in claims 1 and 7-12 are seen to naturally follow from the composition of the disclosed slurry of Brusic Kaufman et al. absence clear and specific evidence showing why said reference composition does not have or could not impart an oxidation potential which would meet the limitation of claims 7-12 and that of claim 1. In the alternative, it would have been obvious to one of ordinary skill in the art through routine experimentation in the art in order to optimize the oxidation potential based on the intended polishing rate since a reduction in oxidation potential would slow down the polishing rate as is known in the art as depicted by Haggart et al. in column 3, lines 36-40.

With reference to the composition being devoid of ammonium, it is noted that even though the reference may disclose the use of surfactant such as sulfate ammonium salts, or the use of pH adjusters such as ammonium hydroxides or the use of oxidizing agents such as ammonium cerium nitrate, they are all embodiments of the present reference and none of them are components that must be present in the disclosed CMP slurry. Thus, the reference is seen to reasonably read on the limitation

of claim 25 taking those of embodiments that do not include the use of ammonium cations.

With reference to copper and copper oxide not being soluble in the slurry as that recited in claim 1, it is to be noted that it's the examiner's position that copper and copper oxide are not soluble in the CMP slurry of Brusic Kaufman et al. since said reference does not disclose any solubility of copper or copper oxide in any of the disclosed CMP slurries.

With reference to the substrate or the surface to be polished to include more than about 5%, 10%, 40%, 50%, or 80% of copper by weight, it is to be noted that Brusic Kaufman et al. teach that the first CMP slurry, as detailed out above, is used to polish a copper containing substrate and to oxidize the copper to copper oxide (column 4, lines 24-27 and 60-67); thus, since the reference is silent to the presence of any other component other than copper in the copper containing substrate, it is the examiner's position that said substrate contains, to a large extent, of copper, and therefore, the reference is taken to read on instant limitation absence clear evidence showing that said reference does not contain more than about 5%, 10%, 40%, 50%, or 80% of copper.

Claims 13-17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brusic Kaufman et al. alone or in view of Haggart, Jr. et al. as applied to claim 1 above, and further in view of U.S. Patent Application Publication No. 2002/0017064 to Shimazu et al.

Brusic Kaufman et al. alone or in view of Haggart, Jr. et al. disclose a CMP slurry having a pH of from about 2.0 to about 12.0, oxidizers such as permanganates, abrasives such as silica and alumina as detailed above.

Although Brusic Kaufman et al. disclose the use of pH adjusters such as bases to adjust the pH, said reference does not expressly disclose that said base may be potassium carbonate.

However, it would have been obvious to one of ordinary skill in the art to modify the polishing composition to have included a pH adjuster such as potassium carbonate to control the rate of polishing copper substrate since bases such as potassium carbonate affects the rate of polishing copper by adjusting pH as that taught by Shimazu et al. ([0024]). It would have been obvious that the two references are drawn to the same filed of endeavor.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brusic Kaufman et al. alone or in view of Haggart, Jr. et al. and in further view of Shimazu et al. as applied to claims 1 and 13 above, and further in view of U.S. Patent Application Publication No. 2003/0212283 to Parker et al.

Brusic Kaufman et al. as evidenced by Haggart et al. and in further view of Shimazu et al. disclose a CMP slurry having a pH of from about 2.0 to about 12.0, oxidizers such as permanganates, abrasives such as silica and alumina as detailed above.

Even thought the references as combined may not expressly disclose the use of cesium carbonate to adjust pH, the use of such compound to adjust pH would have been within the scope of a skilled artisan motivated by the fact that cesium carbonate is also a known alkali metal compound utilized in adjusting pH as that shown by Parker et al. ([0026]); furthermore, Parker et al. teach the use of other compounds such as potassium carbonate in order to adjust pH in a solution, thus, suggesting that potassium carbonate and cesium carbonate are functionally equivalent. It is well settled that the substitution of one functionally equivalent compound for the other is well within the scope of the skilled artisan absence clear evidence showing the contrary.

Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brusic Kaufman et al. alone or in view of Haggart, Jr. et al. as applied to claim 1 above, and further in view of U.S. Patent No. 5,897,375 to Watts et al.

Brusic Kaufman et al. as evidenced by Haggart et al. disclose a CMP slurry having a pH of from about 2.0 to about 12.0, oxidizers such as permanganates, abrasives such as silica and alumina as detailed above.

Although Brusic Kaufman et al. as evidenced by Haggart et al. disclose the use of permanganates oxidizers, they do not expressly disclose the use of an oxidizer such as potassium permanganate; nevertheless, it would have been obvious to one of ordinary skill in the art to utilize potassium permanganate as the permanganate oxidizer used in Brusic Kaufman et al. as evidenced by Haggart et al. motivated by the fact that not only Brusic Kaufman et al. disclose that permanganates are utilized in their slurry as

oxidizer, but also, motivated by the fact that Watts et al. clearly teach that potassium permanganate is a known industrial oxidizer used in CMP slurry utilized to polish copper layers (Watts et al., Abstract; column 1, lines 45-52).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PEGAH PARVINI whose telephone number is (571)272-2639. The examiner can normally be reached on Monday to Friday 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Pegah Parvini/
Examiner, Art Unit 1793

/Michael A Marcheschi/
Primary Examiner, Art Unit 1793